little. Some of them led a wild campaign against the protective treatment of our soldiers against typhoid fever; but nothing worthy of notice came of it. Attempts have also been made lately to use the memory of Miss Nightingale as a sort of stalking-horse for anti-vivisection, and to persuade this nation that Pasteur and Lister were of little worth. Over these and the like vagaries, anti-vivisection is spending its time and its money, hoping, after the war, to recover hold of public attention. Surely it will be disappointed of that hope. The war has burned deep into the hearts of all of us this lesson, that the magnificent work of our Army medical services is indeed founded and built on knowledge made possible by experimental bacteriology. Not all the anti-vivisection societies in the world will ever persuade us to forget that lesson of the war.

NOTES.

SOME little excitement was caused in agricultural circles by an article in the *Times* of April 20 describing how to grow wheat and grass on the same land. The method, if well founded, would revolutionise agriculture and overcome some great difficulties in food production. At present it is impossible to express any opinion, as no sufficient statement of detail has yet been made. It was stated in the article that the Government experts had been much impressed by the method, but inquiries at the Food Production Department put rather a different complexion on the case. According to the article, the method consists in delivering a mixture of wheat- or oat-seed and artificial fertilisers under the surface of grass land in July. By September or October the cereal is stated to have grown from 8 in. to 10 in. high. Livestock are then run on to the field to eat down the corn and grass; the effect of this is said to be a strengthening of root-growth. The protection from frost given to the roots of the cereal by the covering of turf is further said to cause an earlier start of normal spring growth, more heads to be thrown up, more rapid development of the plant, and earlier ripening of the grain. The harvesting is proposed to be done by means of an ordinary mowing machine fitted with an extra knife at the proper height above the grass to cut the heads of the grain. The lower knife is to cut the hay as usual, and the upper knife to act as a "header." Special arrangements are proposed for separately collecting the grain and the straw. It would be easy to enlarge on the advantages of the method if it materialised, but expectations should be repressed until a definite trial has been made and seen by competent observers. Agricultural experiments are just as full of pitfalls as any others, and agricultural literature contains many proposals for revolutionising crop production which, unfortunately, never matured. There is a great deal of evidence to show that growing grass has a pernicious effect on wheat sown in the ordinary way, as careless farmers have often learned to their cost. Mr. Pickering's experiments at the Woburn Fruit Farm further demonstrate the incompatibility of grass and crops. It will be well, therefore, to await definite and unexceptionable evidence before attaching importance to the new claims, which are the subject of a further article in the *Times* of May 1.

A BILL entitled "Coinage (Decimal System)" has been introduced in the House of Lords by Lord Southwark. The measure provides that for the existing coinage of silver, copper, and bronze there shall be substituted a decimal coinage based on the sovereign. All coins below a sovereign are to be multiples of the thousandth part of a sovereign, such part being also minted and called a "mil." The new coinage specified in the schedule to the Bill includes silver coins of the double florin (200 mils), florin, half-florin, and quarter-florin; coins of nickel, or other metal or alloy, of ten mils and five mils; and bronze coins of four, three, two, and one mil. There is a provision to the effect that in the case of any statutory undertaking authorised to levy or demand rates, tolls, charges, or payments the Board of Trade may, on application, fix the amount to be payable in mils in respect of any such authorised rates, etc. If the measure becomes law, the date on which it is to come into operation will be fixed by proclamation. It will be noticed that the proposed legislation closely follows the suggestions put forward by the Decimal Association, which were referred to in NATURE of October 18 last (p. 132). The proposed bronze coins represent very approximately our present penny, halfpenny, and farthing, while, in addition, there is a coin of three mils which is nearly three farthings. This large range of coins of low denominations would probably be found convenient in the equitable adjustment of prices of commodities. The adoption of a decimal coinage has for some years been advocated by bodies representing banking and other commercial interests; and the decimal subdivision of the currency would certainly facilitate accounting work.

ABOUT five-and-twenty cases of a disease believed to be botulism have recently occurred in London and Sheffield. After an incubation period of from twelve to twenty-four hours the disease sets in acutely with paralysis of the internal and external muscles of the eye, dilatation of the pupil, vomiting, arrest usually of the salivary secretion, difficulty of swallowing and loss of voice, and depression of the heart's action, which may cause a fatal issue. The condition is due to a poison found in food by the action of a bacillus, the *B. botulinus*, which chiefly occurs in tinned food, ham, and sausages; from the last-named the name is derived (Latin, *botulus* = a sausage). So far the *B. botulinus* has not been isolated in connection with the present series of cases, and until this is accomplished its exact nature must remain somewhat doubtful.

THE Faraday Society has arranged a general discussion on "The Co-ordination of Scientific Publication," to be held on Tuesday, May 7, at 5.30, in the rooms of the Chemical Society, Burlington House. The discussion, which will be of an informal character, will be opened by Sir Robert Hadfield, Bart., president of the society.

IN reply to a letter addressed to the Board of Trade on the subject of the Lighting, Heating, and Power Order, 1918, the registrar of the Institute of Chemistry has been informed that, "where consulting analytical research and technological chemists and teachers and professors of chemistry are able to show that by reason of their professional needs they have been unable to effect the economy prescribed by the Order, the Board will accept this as a sufficient explanation under paragraph 14 of the Order."

AT the meeting of the Zoological Society of London on April 23, the secretary, Dr. P. Chalmers Mitchell, directed attention to an advertisement that recently appeared in the London Press announcing fur sales by public auction about to be held in the United States. The sales in question are only examples of what take place annually in London and other important commercial centres. The numbers advertised are smaller than usual, no doubt on account of the war, but they include very large quantities of animals the extinction of which cannot be far distant, unless measures are carried out to protect them. In the opinion of Dr. Chalmers Mitchell, which was confirmed by the meeting, there is urgent need for drastic measures to protect mammals. The protection of birds appeals to popular sentiment, and is zealously advocated by many influential organisations. The danger that threatens mammals is even greater, and, on account of their higher intelligence and more sensitive nervous organisation, the cruelty involved in the methods of hunting, trapping, and killing them is incomparably greater.

A FOOD economy (plants) exhibit has been installed in a new case in the Central Hall of the Natural History Museum. The several sections of the exhibit comprise cereals, bread, roots and tubers and other "vegetables," nuts, the pulses, fresh fruits, beverages, and sugar and its substitutes. The plants are those most generally used in the United Kingdom for foodstuffs, and these are shown by specimens, models, drawings, and diagrams. A feature of the exhibit is the series of coloured diagrams showing the values of some typical foods in energy and in building power; comparison of the food-values of different foods is easy, as all the diagrams are on the same scale and each colour has the same significance throughout. Two interesting items appear in the bread section: one is a model of a 2-lb. loaf, the thickness of the several daily rations being indicated by black lines; the other is an analysis of 4 oz. of bread with the actual constituents of a piece of bread of this weight. Food equivalents are exemplified in another part of the case by a series of samples of foods, all of them being equal in energy-value to the 4 oz. of bread.

IN the issue of *Le Génie Civil* for April 20 M. Nicolas Flamel, a French authority, continues the discussion of the German long-range gun. Interesting information is given regarding the type of gun, powder, shell, etc. It appears that the Germans have taken one of their 15-in. naval guns and, by means of the technical process known as relining, reduced the calibre to 8·2 in. The powder is probably an ordinary slow-burning powder, the weight of the charge being increased to give the desired muzzle velocity to the gun. The shell is in two parts, the special fine-pointed head and the body. The shell has special driving bands turned on projecting portions of the body, in addition to the usual copper bands. The burster is either T.N.T. or trinitroanisol (an explosive similar to T.N.T., but having a lower melting-point). The writer of the article does not incline to the theory of a special propellant shell, but thinks the gun has been produced in accordance with the usual practice, with necessary modifications in charge, shape of shell, and other minor details.

AN extraordinary general meeting of the Institute of Chemistry was held at King's College, London, on April 27, to consider matters submitted to the institute by the Executive Committee of the proposed British Association of Chemists, having in view the desirability of effecting the more complete organisation of properly trained and competent chemists. Several resolutions were passed, among them being:—(1) That it is desirable that the council should modify the existing requirements of the institute, in order to include as many chemists as possible in the membership (associateship and fellowship) of the institute, so far as such a course is within the provisions of the royal charter of the institute. (2) That, until December 31, 1921, it is desirable that any candidate who can produce evidence satisfactory to the council of having had a sufficient general and scientific education, and of having practised pure and applied chemistry for not less than seven years, and who holds a responsible position, should be accepted as eligible to apply for admission to the associateship of the institute, provided that he has complied with the provisions of the charter of the institute with regard to age, general education, and scientific training—in chemistry, physics, mathematics, and an optional subject—and that he has passed approved examinations in those subjects. It is the intention of the council to maintain the requirements for fellowship at a decidedly high level. Every associate will be required to produce evidence that since his admission and for a period of three years therefrom he has been continuously engaged in the study and practice of chemistry in a manner satisfactory to the council; and that he has carried out original research of sufficient merit in the opinion of the council, or that he has devised processes or inventions of sufficient merit in the opinion of the council, or, in special circumstances, that he is possessed of knowledge and ability equivalent, in the opinion of the council, to having fulfilled certain specified conditions, otherwise an examination will be imposed. Steps will be taken towards closer co-operation between the work of the institute and that of the universities and colleges; the question of extending the publications of the institute will be reviewed; further endeavours will be made to bring before the public the importance of chemistry to the country, and generally to forward the interests of chemists in every way possible.

MR. SAMUEL HENRY MILLER was a native of Fenland, and lived during the greater part of his life at Wisbech and Lowestoft. Elected a fellow of the Meteorological Society so long ago as 1870, he contributed several papers to its publications, dealing chiefly with observational meteorology, in which he was keenly interested. From 1861–76 he maintained a fully equipped meteorological station at Wisbech, and from 1879–1900 at Lowestoft. An important work by him, written in conjunction with S. B. J. Skertchly and others, is "The Fenland: Past and Present" (1878), in which the principal characteristics of this famous and interesting district are efficiently described. Other works written at that time are "A Guide to the Fenlands" and "The Camp of Refuge." A record of the gales experienced round the British coasts was contributed to *The Shipwrecked Mariner* in 1887. Mr. Miller was a gold medallist and foreign member of the Society of Arts and Sciences, Utrecht, and a fellow of the Royal Astronomical Society for nearly forty years. He left Lowestoft in 1900, and spent the remainder of his life in quiet retirement at Deal, where he was buried on April 20 at the advanced age of ninety-four years.

DR. J. MICHELL CLARKE, whose death occurred at Looe, in Cornwall, on April 21, was Pro-Vice-Chancellor and professor of medicine in the University of Bristol. He was a son of the late Mr. W. Michell Clarke, of Clifton, and was educated at Dr. C. T. Hudson's school at Clifton, Clifton College, Caius College, Cambridge, Bristol Medical School, and St. Thomas's Hospital. He took the M.B. degree at Cambridge in 1885, M.D. in 1892, and became F.R.C.P. (Lond.) in 1896. At Cambridge he favoured anatomy, in which subject he held a junior demonstratorship, but experience of clinical work soon convinced him that his true vocation lay on the medical side. In London he became house physician at St. Thomas's, and on returning to Clifton settled down as a physician. Dr. Clarke acted as lecturer on practical physiology, and later on as professor of pathology, in the Bristol Medical School; in 1907 he became senior physician to the Bristol General Hospital. He held a position of considerable influence, and was one of those chiefly concerned in the establishment of Winsley Sanatorium. Much of Dr. Clarke's scientific work was concerned with the welfare of his patients, and the list of his formal published writings is less extensive than might have been expected, though this is compensated for by the contributions, often of immediate utility, which he made to the medical journals. Amongst his writings may be mentioned "Hysteria and Neurasthenia," "Family Periodic Paralysis," "Spinal Cord Degenerations in Anæmia," and contributions to Quain's "Dictionary" and Allbutt's "System of Medicine." In 1915 he held the Bradshaw lectureship, and last year he was elected a member of the council of the Royal College of Physicians.

Dr. A. H. Carter, whose death occurred at his residence at Abingdon on April 1, was well known in Birmingham as a distinguished physician and an enthusiastic advocate of public and social work affecting the community of that great industrial centre. He was born at Pewsey, Wiltshire, and educated at Epsom College and University College, London, where his career as a student was marked by many distinctions, including gold medals in comparative anatomy, forensic medicine, and clinical medicine, also with silver medals in physiology and practical physiology. Dr. Carter took the degree of M.B. at the University of London, gaining first-class honours in physiology. In 1871 he was appointed house surgeon to the General Hospital, Wolverhampton, and two years later became pathologist at the General Hospital, Birmingham, afterwards as house physician, taking his M.D. degree in 1872. In 1876 he became a member of the Royal College of Physicians, and was elected a fellow of the college in 1881. Afterwards he was appointed physician to the Queen's Hospital, Birmingham, and became professor of medicine at Mason College, and later held the same office at the newly constituted University. Thus he was closely connected with the cause of medical education in Birmingham, and actively promoted the growth of the medical school in its affiliation to the University from Mason College. Dr. Carter's writings were mainly of a professional kind. In 1895 he published a text-book on the practice of medicine, which has reached the eighth edition. As president of the Birmingham branch of the British Medical Association in 1895 he gave an interesting address on "Rationalism in the Study and Practice of Medicine."

We have received the seventy-eighth annual report (for 1917) of the Crichton Royal Institution, Dumfries. The physician-superintendent, Dr. Easterbrook, contributes a general account of the activities of this mental hospital. The causes of illness among the admissions for the year showed a decline due to alcoholism, but an increase due to venereal diseases. Results of ten years' treatment are discussed: the recovery rate is 35 per cent. among the certificated, and 46 per cent. among the voluntary, patients. Various experiments on potato-growing, cattle-breeding, and cattle-feeding have been carried out at the farm. The pathological research laboratory has been closed owing to the absence of the pathologist, Dr. Cruickshank, on war work. Notes on meteorological observations and data are included.

Students of animal behaviour will find some interesting facts on the "drumming" of the ruffed grouse (*Bonasa umbellatus*) in *Forest and Stream* for April, illustrated by a series of remarkable photographs, probably the first of the kind which have ever been taken. The author, Mr. F. K. Vreeland, had the good fortune to watch at close range one of these birds while "displaying," and he is convinced that the strange drumming sound then made is produced by the use of the wings alone. This may indeed be the case, but we suspect that later investigations will show that these sounds are at least partly vocal. The dissection of the syrinx would afford valuable evidence on this point. The author is apparently so much of an "outdoor naturalist" that he has never read any of the voluminous literature on this theme of courtship displays. But in some respects this adds rather than detracts from the value of his observations, since his records are made without bias.

The deplorable results which are likely to accrue from hasty war-time legislation in regard to the Wild Birds' Protection Acts and game laws, in response to popular demand, are briefly commented upon in the *Scottish Naturalist* for April by Mr. Hugh S. Gladstone. The vindictiveness displayed towards the pheasant, he points out, is by no means justified. On overstocked estates these birds are certainly harmful to the farmer, but where the head of game is proportionate to the size of the estate they perform most useful work in clearing the ground of wireworm. It is certainly remarkable that, while we are severely penalising all kinds of "game," the French Government is making inquiries as to how best to restock the devastated area of the war-zone with partridges and hares. "It is to be hoped," Mr. Gladstone remarks, "that at no distant date there may be set up in this country an ornithological bureau similar to that already in existence in the United States."

It is seldom realised that almost one-third of the continental part of Canada, or nearly a million square miles, must be regarded as unexplored. This is the estimate of Mr. C. Camsell, who has published in the *Geographical Review* for March (vol. v., No. 3) a map showing the location of the unexplored areas. In the same issue Mr. Camsell has a paper on some of the geographical problems awaiting solution in northern Canada. Recent discoveries have added more than 2000 square miles to the area of the Great Slave Lake, but few of its shores are yet surveyed. The Caribou Plateau, north of the Peace River, is a great unknown area, although it lies within easy access of settled regions. An even larger unexplored area lies north of Lake Athabaska, around the headwaters of the Thelon and Taltson rivers. On all sides of Hudson Bay there are huge areas which no white traveller is recorded to have crossed.

La Nature for April 6 describes a new form of voltaic cell, with electrodes of zinc and carbon in a solution of sal-ammoniac, which is due to M. Féry, and has been in use for some time on two of the French railways. The negative electrode is a plate of zinc which rests on the bottom of the glass containing-jar, the copper wire connected to it being insulated up to a point well above the level of the solution in the jar. The positive electrode is a carbon tube of diameter about half that of the jar, pierced with holes, which rests on the zinc plate, being insulated from it by an ebonite cross. The evaporation of the sal-ammoniac solution is retarded by the wooden cover. During the action of the cell the lower part of the solution becomes acid owing to the descent of the dense zinc chloride, while the upper part becomes alkaline owing to the ammonia produced. The depolarisation of the cell is effected by the air alone.

The electromotive force of the cell is 1·18 volts, and a cell giving 90 ampere-hours weighs only 2·1 kilograms.

The work begun by Pollok and Leonard in 1905, on the spectrographic determination of metallic elements when present in solution in small quantities, has lately been extended to lithium, rubidium, cæsium, and gold by Messrs. A. G. G. Leonard and P. Whelan. The results are stated in a paper which appears in the Scientific Proceedings of the Royal Dublin Society, vol. xv. (N.S.), No. 25. In each case solutions of various strengths down to 0·001 per cent. were examined, and the tables show the relative persistency of the various lines as the concentration was diminished, thus providing a basis for quantitative analysis. Lithium and cæsium could be detected in 0·001 per cent. solutions, but rubidium and gold showed no lines in solutions of strength less than 0·1 per cent. Some of the photographs are reproduced, but, in the absence of a scale, comparison with the tables is somewhat difficult. A line at 2478 in the spectra of metallic lithium and rubidium, which the authors were unable to identify, was probably due to an impurity of carbon.

We have examined a new astronomical model designed for use in schools and colleges by Dr. William Wilson. Those who saw the model at the Royal Astronomical Society last year must have been struck by its educational value, and will welcome the announcement that copies of it are to be placed on the market after the war, the matter of price being left for determination later. The model represents, with correct relative angular velocities and axial poses, the rotational and revolutionary movements of sun, earth, and moon, and the changes in the moon's orbit plane. Clockwork and cog-wheels are not employed, the movements being effected by taut endless strings passing over pulleys; each string has a tension regulator, easily adjusted to give the necessary tension. By slackening some of the tensions the corresponding movements are put out of action, so that the student can study simple cases, such as a planet revolving without rotation or a moon moving in the same plane as its primary. Fine adjustments are obtainable by slight alteration of the distance between the two half-discs into which the pulleys are divided; thus the severe test of the Saros eclipse cycle of 18 years 11 days was shown to be satisfied within a very small quantity; so the machine is not a mere toy, but is capable of giving graphical solutions of problems. The phases of the moon are shown by covering half of the white lunar globe by a black cap, which always keeps on the side opposite to the sun. Cones of different lengths can also be put on the moon to represent its shadow, and the production of total or annular solar eclipses. As Prof. Eddington has pointed out, the chief difficulty experienced by astronomical students is generally that of picturing relations that cannot be represented on a plane surface, but involve three dimensions. For such the model should prove very helpful. Full particulars of the model are given in an illustrated pamphlet to be obtained (post free 6*d*.) from Dr. Wilson, 43 Fellows Road, London, N.W.3.

We have received a copy of a recent publication of the United States Bureau of Standards (Circular 67), entitled "Combined Table of Sizes in the Principal Wire Gages." This table includes the numbers and sizes in the following systems of wire gauges: American B. and S. (Brown and Sharpe), Steel (Stl.W.G.—known under the various names "Washburn and Moen," "Roebling," "American Steel and Wire Co."), Birmingham (Stubs'), British legal standard, and Metric. It gives the diameters of all the gauge numbers in these five systems in mils, inches, and millimetres, also the cross-sections in square mils, circular mils, square inches, and square millimetres. The table will probably be found useful by manufacturers who wish to determine the nearest equivalent in American or British sizes of wires, specified in millimetres or square millimetres, or *vice versa*. It should be noticed that the Stubs' Birmingham gauge is not the same as the series of sizes legalised in the United Kingdom in 1914 under the denomination "Birmingham gauge (B.G.)." The latter system is practically identical with the series of numbers and sizes issued by the South Staffordshire Ironmasters' Association in 1884, and is chiefly used for sheet and hoop iron and steel; but it is quite different from the legal American system ("Standard Gage for Sheet and Plate Iron and Steel," Bureau Circular No. 18). It is an excellent idea to issue in a handy form lists of the principal wire-gauge systems of America and the United Kingdom, and this table is likely to have a wide sphere of utility. A copy may be obtained on application to the Bureau of Standards, Washington, D.C., U.S.A.

The tendency to utilise drop stampings has become very marked in recent years, and the advantages of these substitutes for forgings and castings have led to considerable developments in connection with munitions. Of the two chief methods of lifting the stamp steam is the older, but friction lifting is becoming more popular. Until recently the heaviest weight of tup and die dealt with by friction was about five tons, of which the tup weighed four tons. Messrs. B. and S. Massey, of Manchester, have now built two stamps capable of dealing with weights up to 9·5 tons, and these machines form the subject of an illustrated article in the *Engineer* for April 19. The stroke of the tup is 7 ft., and the lifting speed is 320 ft. per minute. Power is supplied by a 200-h.p. electric motor. The lifting mechanism consists essentially of a heavy clutch operated through a light relay clutch. The connection between the lifter and tup is made with strong woven belting 15 in. wide. When the tup is held suspended, the power delivered by the motor is dissipated in work done against friction and converted into heat; hence the necessity arises for cooling the clutch by circulating water, which in these machines is maintained in circulation by means of a pump.

Among the announcements of forthcoming books of science we notice the following:—"Tidal Lands: A Study of Shore Problems," A. E. Carey and Prof. F. W. Oliver (*Blackie and Son, Ltd.*); "The Production and Treatment of Vegetable Oils," T. W. Chalmers, and a new edition of "Industrial Electrical Measuring Instruments," K. Edgecumbe (*Constable and Co., Ltd.*); "Modern Engineering Measuring Tools," E. Pull, "Military Observation Balloons," E. J. Widner, and "Seasoning of Wood: A Treatise on the Natural and Artificial Processes employed in the Preparation of Lumber for Manufacture," J. B. Wagner (*Crosby Lockwood and Son*); "Savage Survivals," J. Howard Moore, and a selection of the lectures and essays of the late Prof. W. K. Clifford (*Watts and Co.*).

Messrs. Macmillan and Co.'s new list of forthcoming books includes a new edition of "An Elementary Treatise on Curve Tracing," Dr. P. Frost, revised by Dr. R. J. T. Bell; "The Statesman's Year Book, 1918," edited by Sir J. Scott Keltie, assisted by Dr. M. Epstein; "The Military Map: Elements of Modern Topography" (French School of War), complete in one volume, with maps; "Examination Papers in Elementary Engineering," R. M. Milne; "Alcohol and Life: A Manual of Scientific Temperance Teaching for Schools," J. A. Hunter, illustrated; "Essentials of Practical Geography," B. C. Wallis (Practical Modern Geographies); "A Geography of America," T. Alford Smith (Practical Modern Geographies).

OUR ASTRONOMICAL COLUMN.

MINOR PLANETS.—Mr. H. E. Wood records a number of minor planets on plates taken last year at Johannesburg. They have been identified by M. Louis Fabry (Marseilles Circular, No. 10). The most interesting is 722 Frieda; this planet had not been observed since its discovery in 1911, so its recovery is fortunate. The *Astronomical Journal*, No. 729, contains elements of an unidentified planet discovered at Washington by Mr. G. H. Peters last November. It may be identical with 293 Brasilia, 1906 WF, or 1911 LU. If new, he proposes the name Washingtonia. Prof. Barnard followed the Wolf planet DB until April 4, when its magnitude was 15. It has been so well observed that it ought to be possible to secure its re-observation at the next perihelion in 1922.

THE CEPHEID VARIABLE SU CASSIOPEIÆ.—Further investigations of this interesting variable star have been made by W. S. Adams and H. Shapley (*Astrophysical Journal*, vol. xlvii., p. 46). Mr. Shapley had already shown that the variation could not be interpreted as the result of the rotation of a simple ellipsoidal body, and the conclusion that the star is a Cepheid has been verified by the new spectroscopic observations. The range of photographic magnitude, according to Parkhurst, is from 6·52 to 6·99, and the variations of radial velocity, −18 to +4 km., are correspondingly small. A period of 1·9495 days satisfies both series of changes, and the epoch of maximum negative velocity precedes the maximum of light by 0·05 day. The spectral type varies from A9 at maximum to F5 at minimum. Taking the visual magnitude as 6·23, as given by Boss, the spectroscopic parallax is identical with that derived by Van Maanen, namely, +0·010″ ± 0·003″.

NEW DOUBLE STARS.—Mr. R. G. Aitken's twenty-fourth list, giving details of 100 new double stars, appears as Lick Observatory Bulletin No. 306. This observer's systematic survey of the sky was initiated in 1899, and the present list brings his total published discoveries up to 3000, the region covered being from the pole to declination 14° S., and to declination 22° S. from 13h. to 1h. right ascension. All the stars included are under 5″ in distance, and in the present list nearly half are less than 1″ apart, while sixteen do not exceed 0·3″. The brightest star included is 41 Ophiuchi, the components of which are rated as magnitudes 4·6 and 7·6, the position angle and distance being 298° and 0·52″ respectively.

JOURNAL OF THE CHALDEAN SOCIETY.—We have pleasure in directing attention to a small astronomical magazine which is issued quarterly by the Chaldean Society under the title of *The Chaldean*. The publication has now reached No. 10 of the first volume, and while dealing with astronomy generally, its special appeal appears to be to observers of meteors. The recent issue includes an article on astronomical photography, and several notes on meteors by Mr. Denning and others. A feature of particular interest is a facsimile of a page from the observation book of the late Prof. A. S. Herschel, which furnishes a good example of the method of recording meteors. Communications should be addressed to the editor, Mr. J Hargreaves, Bennington, Stevenage, Herts.

RECENT WORK IN MINERALOGY AND PETROLOGY.

A MINERAL variously labelled johannite and uranopilite in collections has yielded to Messrs. E. S. Larsen and G. V. Brown the composition $RO.UO_3.SO_3.4H_2O$, where $R = Cu,Fe,Na_2$ (the *American Mineralogist*, vol. ii., p. 78, 1917). The new species thus indicated is called gilpinite, from the typical locality Gilpin Co., Colorado; but a Cornish specimen, one of those styled uranopilite, proves to be identical. The authors insist that optical tests under the microscope are characteristic, and that their application shows that more than one-third of the hundred specimens of "secondary uranium minerals" examined from various museums are incorrectly labelled.

Mr. A. E. V. Zealley, in "Notes on Newly Recorded Rhodesian Minerals" (Proc. Rhodesia Sci. Assoc., vol. xvi., p. 17, 1917), includes an account of the stanniferous tantalite of the Victoria tinfield, discovered in 1911, but not hitherto described. Two other Rhodesian occurrences of tantalite are noticed.

Messrs. R. C. Wells and B. S. Butler describe (Journ. Washington Acad. Sci., vol. vii., p. 596, 1917) a mineral sulphide of tungsten, under the name of tungstenite. The composition is probably WS_2, and the specific gravity is near 7·4. It looks like graphite, and has a hardness of only 2·5. This mineral occurs in some abundance in a vein with galena, pyrite, tetrahedrite, and argentite, in Salt Lake Co., Utah.

The view advanced by Mr. J. B. Scrivenor in 1910–14 as to the age of the detrital tin deposits of the Kinta district, Perak (see NATURE, vol. xciv., p. 348), has now been disputed in a detailed paper by Dr. W. R. Jones (Quart. Journ. Geol. Soc., vol. lxxii., p. 165, 1917). Mr. Scrivenor urged that these bouldery deposits were derived from the surface of Gondwanaland during the Permian ice-age, which is responsible for the Talchir Beds of India. Dr. Jones, however, connects the tin ore with the Mesozoic granite now *in situ* in the district, and he brings forward strong evidence to show that there is only one alluvial tin-bearing series in Kinta, instead of two, superposed on one another, and separated by a long geological interval.

Those acquainted with the work of Mr. W. H. Goodchild on the Insizwa Range in the Cape Province (Inst. of Mining and Metallurgy, Bull. 147, 1916) will welcome the publication of Dr. Du Toit's researches in the area, extending from 1903 to 1912 (Du Toit and Rogers, "The Geology of Part of the Transkei," South Africa Geological Survey, Explanation of Sheet 27, 1917). The geological map, showing a magnificent series of dolerite sills, penetrating the Karroo strata up to the highest Stormberg beds, is now also issued, on a scale of 1 : 247600. The Insizwa gabbro, with its copper ores bearing nickel and platinum, is included in the north-east of the sheet, and the memoir contains a map showing the whole of the gabbro-norite masses. The three sulphides—chalcopyrite, pentlandite, and pyrrhotine—have separated from the igneous rock in the order in which they are here named, as a gravitative differentiation-product in the concave floor of a great sill. Forty-five miles of visible contact along the base of this sill await systematic exploration. The occurrence is discussed, in comparison with that at Sudbury, in the recently issued report of the Ontario Nickel Commission.

Prof. R. A. Daly ("Low-temperature Formation of Alkaline Felspars in Limestone," Proc. Nat. Acad. Sci., vol. iii., p. 659, 1917) describes a dolomite from Waterton Lake, on the Montana and Alberta border, which contains 34·5 per cent. by weight of orthoclase and